

Copper ROOFS AND DECKS FOR RESIDENCES

Roofing



FOREWORD

This is the second of a series of monographs published to assist the architect and sheet metal worker in the proper application of Sheet Copper. The first, entitled "Copper Valleys and Flashings for Residences" dealt with the use of Sheet Copper as an accessory when other materials form the roof itself. Copper has a wide acceptance as a roofing material and this monograph treats of the installation of Copper for Roofs and Decks. There are three types of construction for Copper roofs: Standing Seam, Flat Seam and Batten. Herein are described standing seam and flat seam applications, a later pamphlet similarly covering batten construction. When properly applied, any of these methods should prove satisfactory. This monograph deals primarily with the

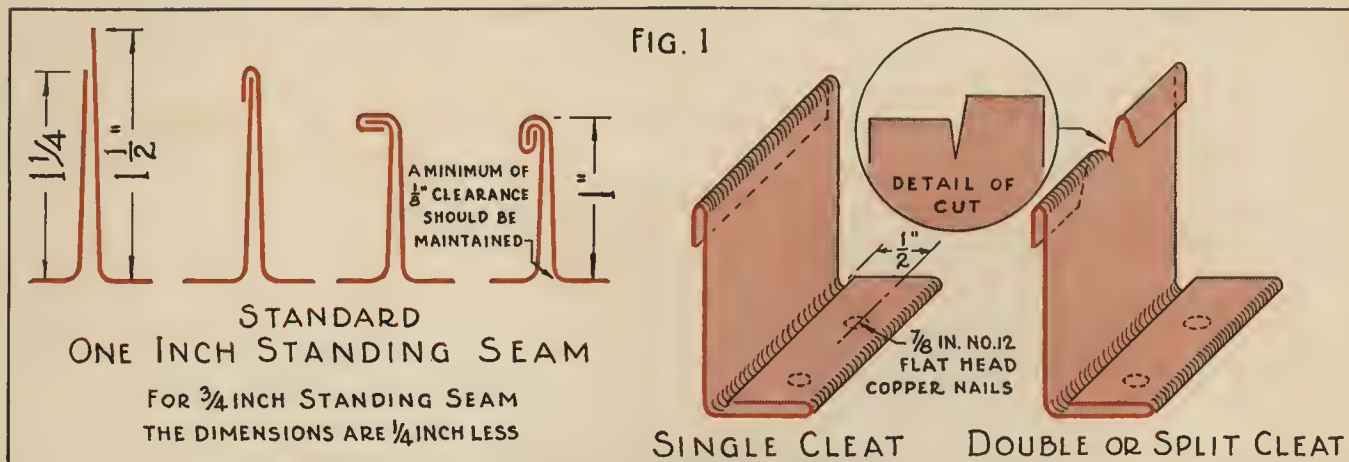
standing seam method, as experience has shown that it is generally the most suitable and most frequently used type for residences.

It is the intention to illustrate only the most essential features of standing-seam and flat-seam roofing details. The subject has been fully covered and completely illustrated in the Copper & Brass Research Association's "Sheet Copper Handbook." Other handbooks published by the Association are "Protection against Termites," "Brass Pipe" and "Copper Tube." Any of these publications will be sent to architects, engineers, sheet metal or plumbing contractors upon request and the Association will endeavor to answer such questions as may arise relating to the use of Copper products.

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STANDING SEAM ROOFS

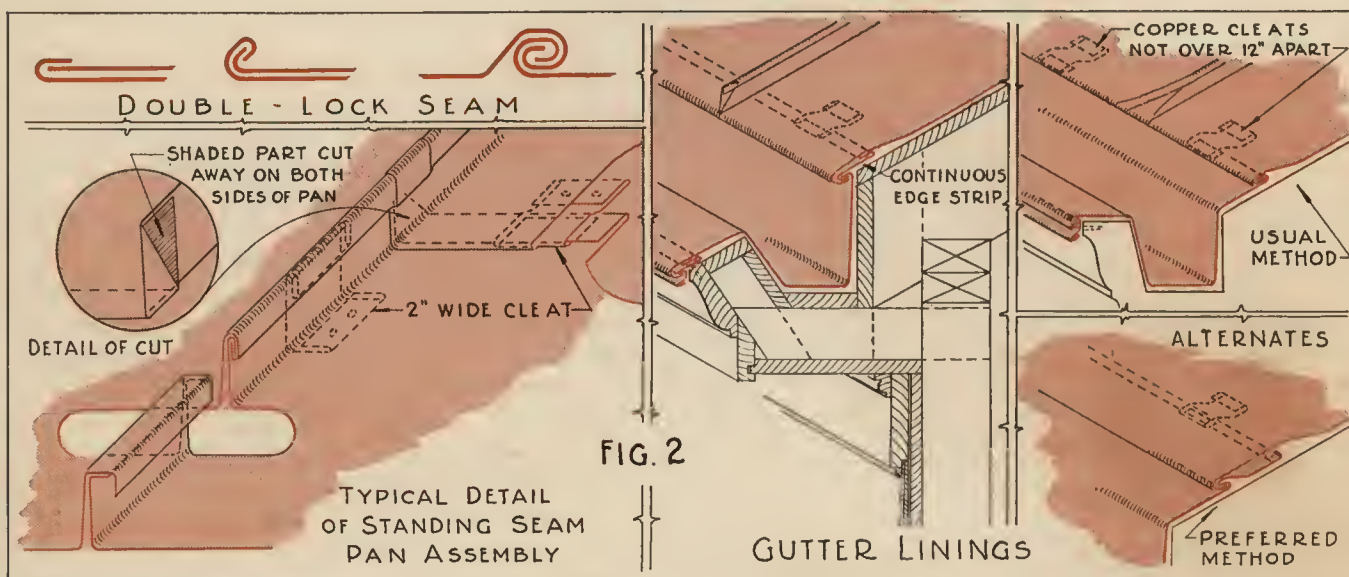
Standing seam roofs are constructed by assembling pans of either cold rolled or soft copper. Starting with a 20" x 96" sheet, these pans are usually formed in the shop by bending a 1 1/4" edge on one of the long sides and 1 1/2" on the other. The pans should be tapered lengthwise at least 1/16" to permit the upper pan to telescope into the lower. It is good practice to bend the pans carefully with the standing seam edges started, as shown in the left hand sketch of Fig. 2.

After thoroughly cleaning the roof surface, a good quality of waterproof paper, properly lapped, is attached to the sheathing with copper nails, using copper cleats which are folded over the nail heads. Then the copper pans are hooked at the eaves to the top of the gutter lining or molded gutter. With half-round gutters, an apron is turned down into the gutter. After one 8' sheet has been placed at right angles to the eaves gutter, the adjoining sheet is cut to bring the cross seam at the center of the first sheet, staggering the seams to avoid too many thicknesses of copper at one point in

the standing seam. The pans are then continued to the ridge with 3/4" loose lock cross seams, properly cleated as shown in Fig. 2. The copper sheets are sometimes double locked, forming rolls extending from eaves to ridge line. The double lock seams are also shown in the upper left corner of Fig. 2.

At the eaves, the roofing copper is locked to the top edge of the gutter lining, if this edge is higher than the front of the gutter. The alternate method is used if the outer edge is level with the inner edge so that there is danger of water backing up into locked seam. Where the preferred method as illustrated in Fig. 2 is used, it is best to form the fold to which the roof sheets are hooked, as well as the top edge, in the shop. Valley tongs are used to bend the gutter lining at the building.

Rolls of copper roofing sheets, with locked and soldered cross seams, may be prepared in the shop. This method is preferred if there is danger of leakage because of an exceptionally flat roof pitch but it is then important to provide for movement of the entire run by



CHIMNEY FLASHING AND STANDING SEAM ROOFING FIG. 3

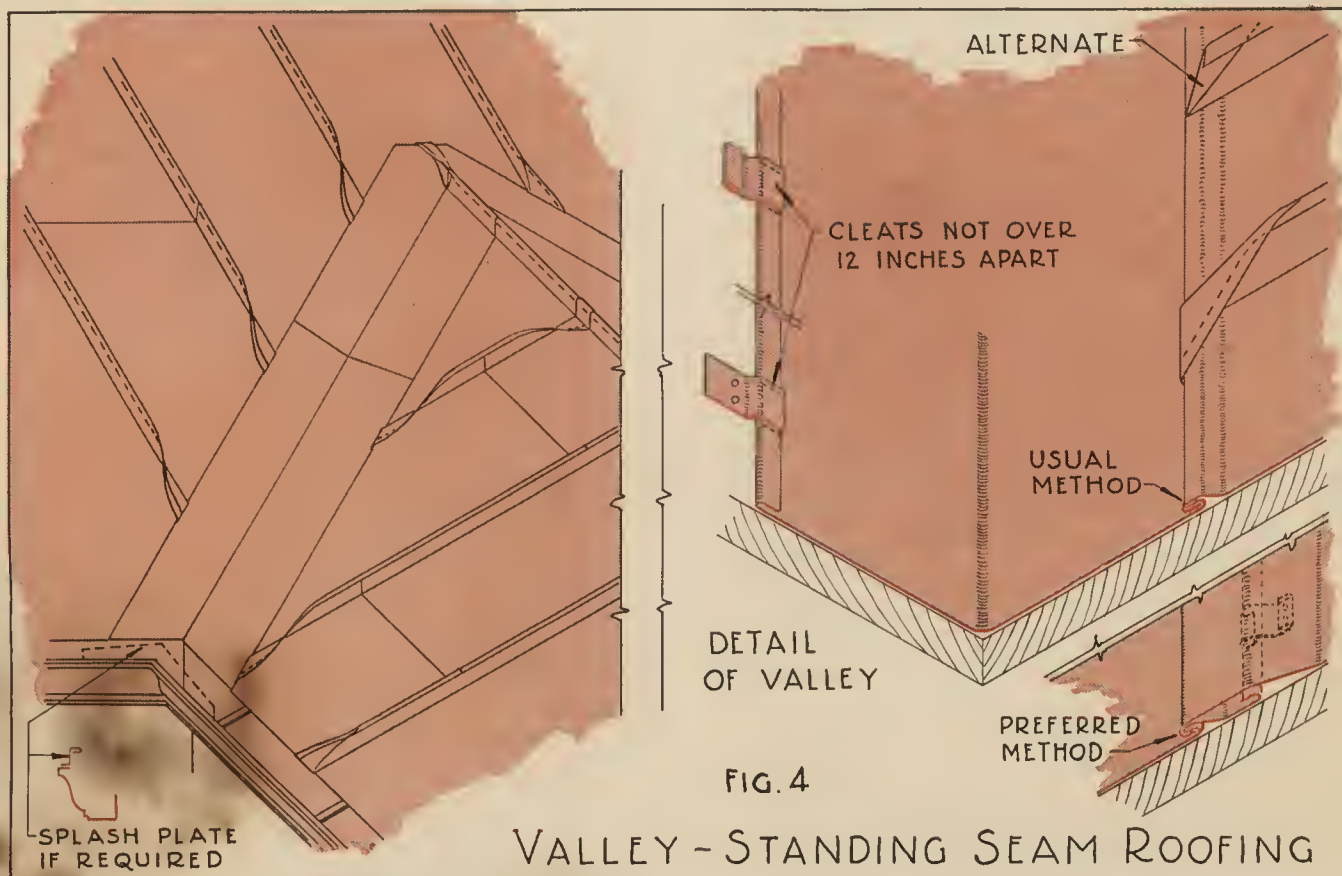
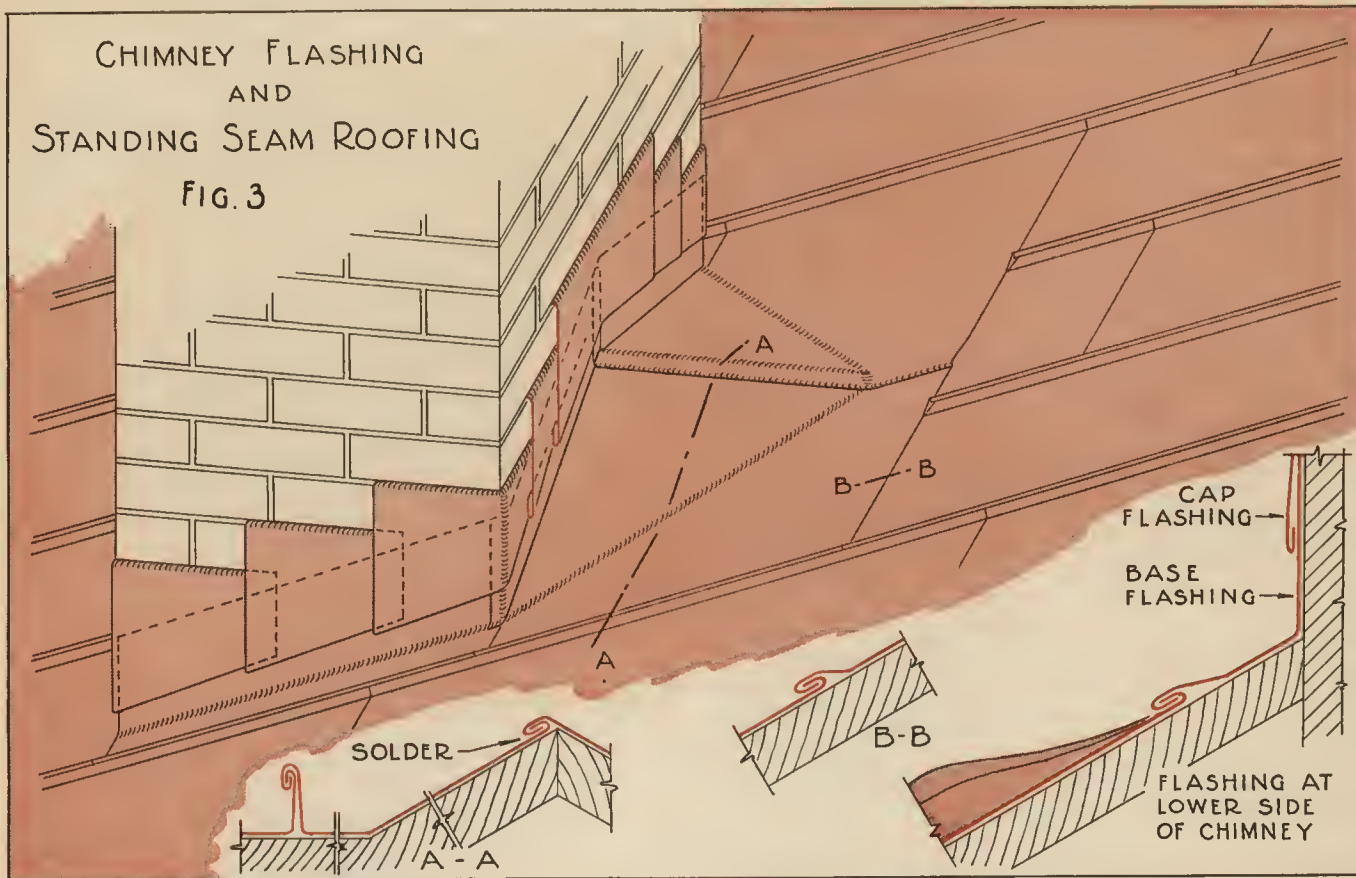
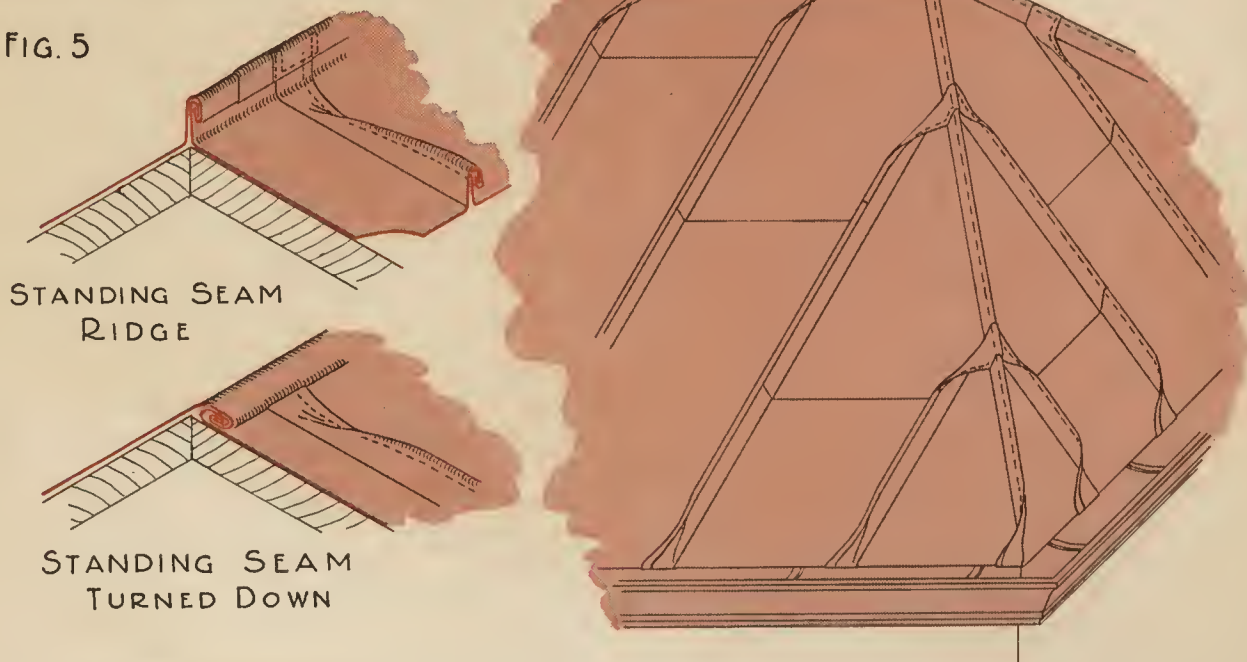


FIG. 4
VALLEY-STANDING SEAM ROOFING

HIP AND RIDGE - STANDING SEAM

FIG. 5



loose locking at the ridge and eaves. The edges are then turned with tongs and seamed with either Treadle Seamer or Hand Roofing Double Seamers.

At the chimney, if mortar is removed from the joints for the flashings, it should be done before the copper roofing is laid, to avoid accumulation of debris under the copper. The copper roofing is joined to the copper saddle flashing as shown in Fig. 3.

It is important that the work be laid out so that the standing seams are not too close to the sides of the chimney. If the standing seams are too close, they will interfere with the drainage, causing water to back up into the seams.

At the lower side of the chimney, the standing seams of the roofing copper are flattened and the sheet has a $\frac{3}{4}$ " hook edge turned up. A border strip, which forms the base flashing, is locked to this edge, also shown in the right hand corner of Fig. 3.

The usual method of folding standing seams is to have the lock at the top of the standing seam turned on the under side at the ridge and to have this seam show on top of the folded seam at the eaves. An exception to this is where the standing seams terminate at the valley intersections. Here the standing seams are folded down in the direction of the slope of the roof so that smaller pockets are formed. Unless the preferred method shown in Fig. 4 is used, the intersection should be soldered to prevent leakage. Where the ridge and two hip standing seams intersect on a hip roof, copper pans may be prepared as shown in Figs. 5 and 6.

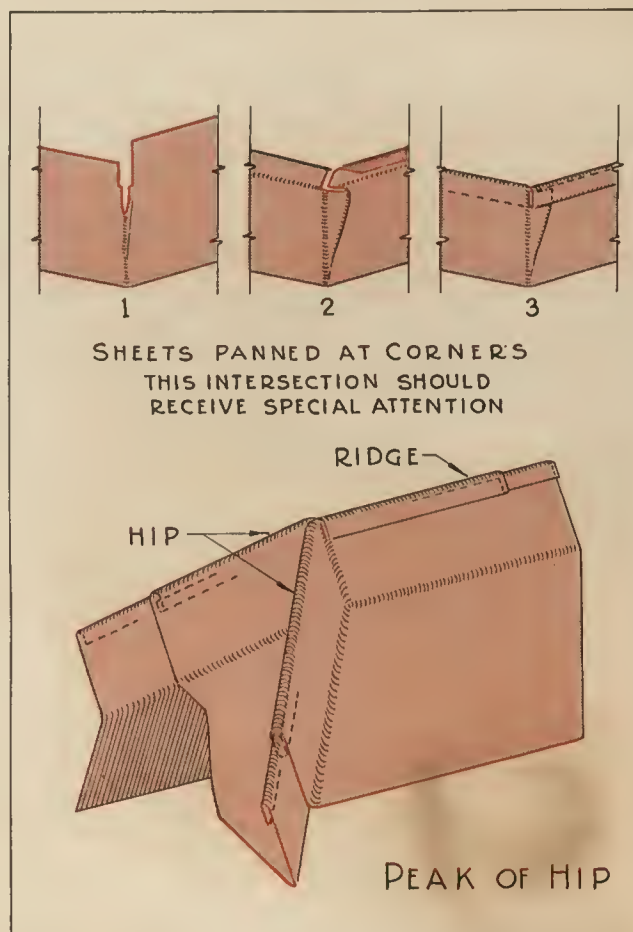


FIG. 6

FLAT SEAM ROOFING

FIG. 7

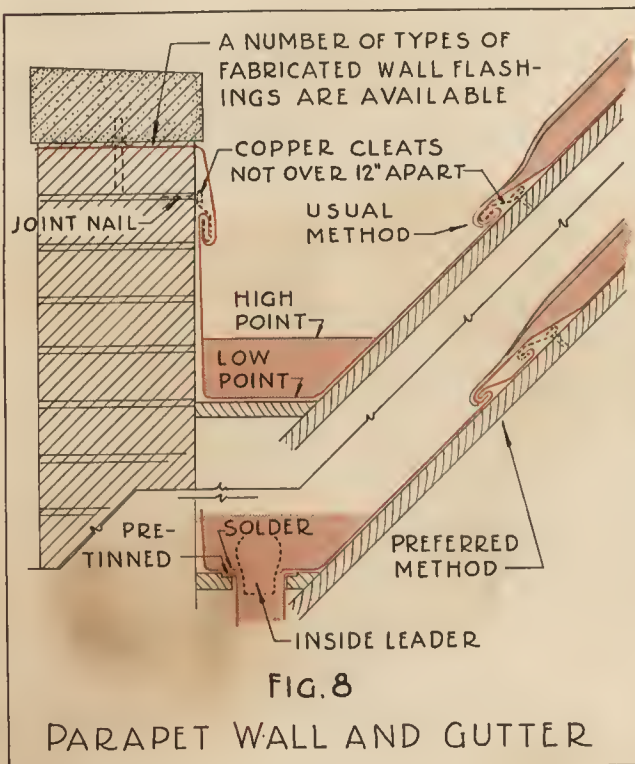
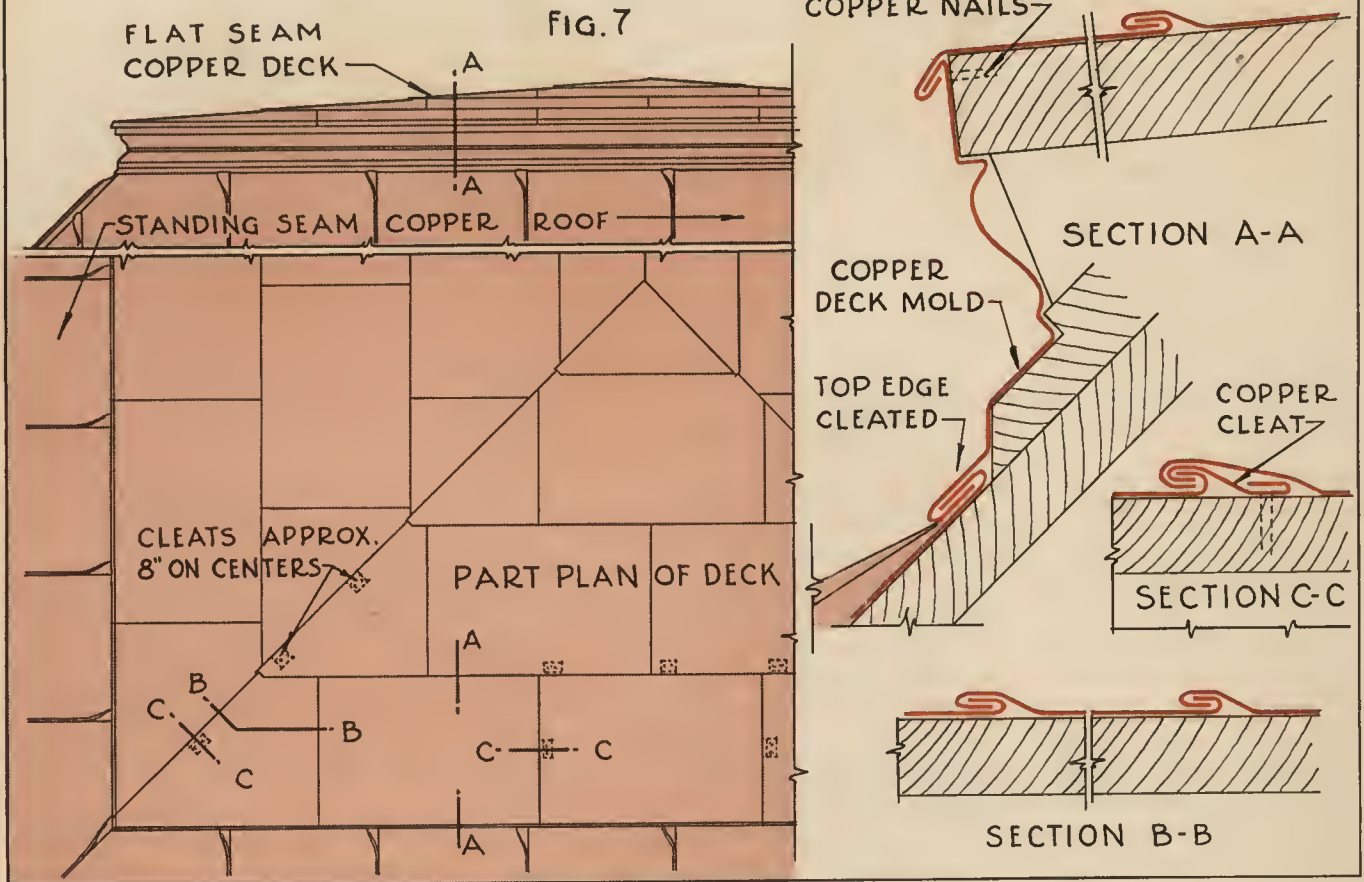


FIG. 8

PARAPET WALL AND GUTTER

The gutter lining back of a parapet wall should have a decided pitch towards the outlets. It should be of ample capacity to drain without overflowing the seam to which the roofing sheets are locked or the top edge of the gutter lining against the parapet wall. Scuppers provide insurance against overflow should drains become clogged.

FLAT SEAMS may be used for roofs having a pitch as low as $\frac{1}{2}$ " per foot. After the roof deck has been thoroughly cleaned, apply a good waterproof paper, properly lapped to drain toward the outer edge of the roof.

The usual size of copper sheets for flat seam installations is 14" by 20", with $\frac{1}{2}$ " edges turned as illustrated in Fig. 7. After the eaves course is hooked to the top edge of the copper deck mold and is properly cleated, the next course is started by staggering the seams midway between the seams of the first course. It is recommended that a cleat be used close to the seams which run with the slope of the roof; however, not directly over this seam as there would be too many thicknesses of copper at one point. On very flat pitched roofs, it has been customary to ignore hip lines and run the sheets straight through.

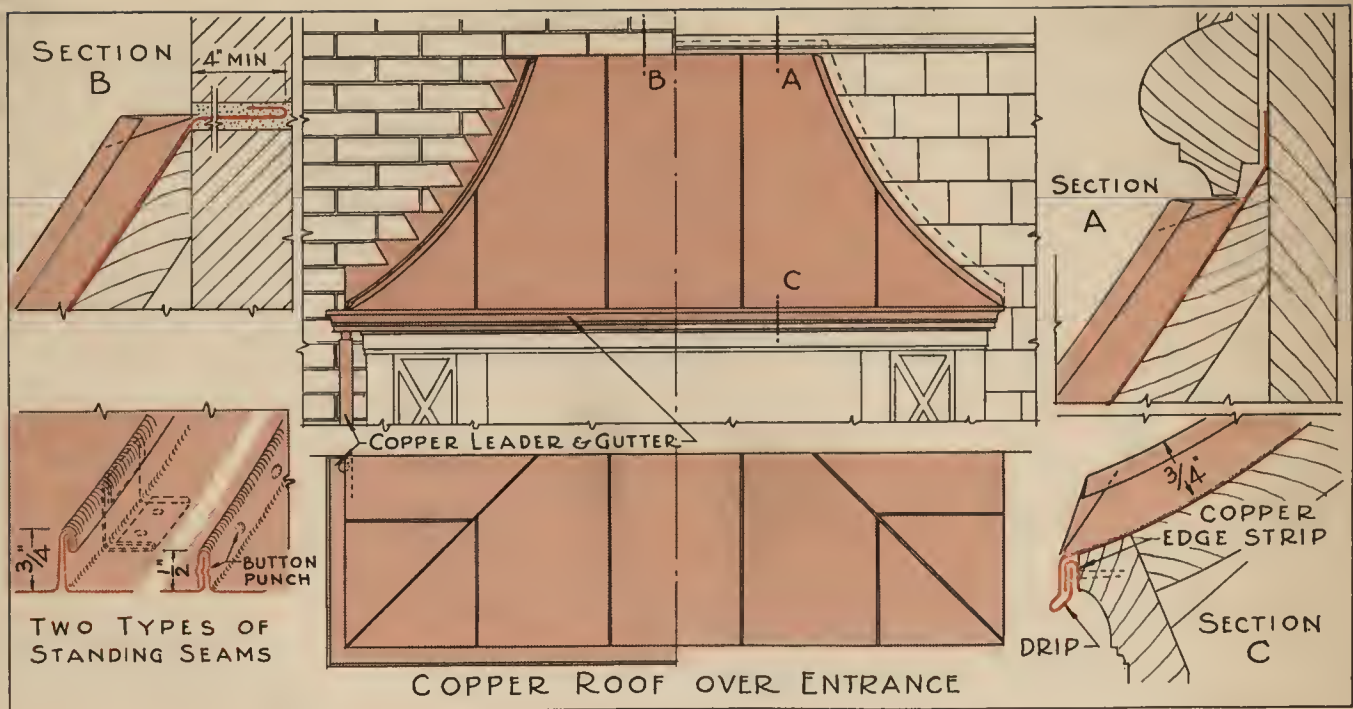


FIG. 9

On flat pitches, copper may be laid in 14" wide rolls, made up of 14" by 20" sheets in the shop. Seams may be made at hips and ridges with either flat or standing seams, preferably standing seams where the area is large enough to justify their use. This will make a slight provision for expansion and contraction.

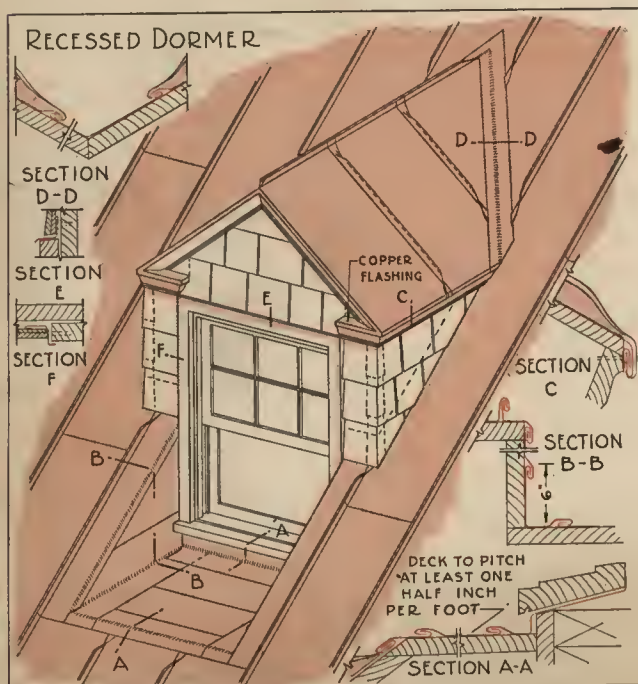


FIG. 10

When roofs over bay-windows or entrances are built with a curvature, the standing seams are made only $\frac{3}{4}$ " high to facilitate forming them and make them less conspicuous. Single lock seams, $\frac{1}{2}$ " high, may also be used on very small areas. These seams make the best appearance when they are formed in straight lines from top to bottom. The standing seams are closed at the top and at the bottom by folding over a triangular shaped end tight against the seam. At the top the sheets are turned into the brick joint or the top of the pans may be turned up $1\frac{1}{2}$ " against the wall and then cap-flashed with a separate strip of copper which is notched out at the standing seams.

On recessed dormers, the valley of a dormer roof should be of sufficient width so that drainage from the main roof will not cross it. At the sides of the dormer the roofing sheet should be turned up at least 6" behind the wood shingles. The area of the roof in front of the dormer should drain out on the main roof and be laid with flat seams. The flat seams of this roof as well as the sides of the recess should be cleated and soldered. The two tops of the level return at the gable end of the dormer should be covered with copper and flashed in back of the shingles. Where the main roof terminates at the sides of the recess, the roofing sheets are locked to the flat seam copper area and turned down. Only the lower end need be thoroughly soldered.

The foregoing has dealt with the standing seam and flat seam type of roof construction. A later monograph will treat of copper roofs of the batten type.



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FIG. 10

The two tops of the level return at the gable end of the dormer should be covered with copper and flashed in back of the shingles. Where the main roof terminates at the sides of the recess, the roof sheets are locked to the flat seam copper area and tied down. Only the lower end need be thoroughly soldered a length of 6". The foregoing has dealt with the standing seam and flat seam type of roof construction. A later monograph will treat of copper roofs of the batten type.